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The Effect of IT Investment and Carbon Emission Disclosure on Firm Value: A Case Study of Manufacturing Companies Listed on the Indonesia Stock Exchange in 2020-2024

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Abstract

This research looks at how investments in information technology and the disclosure of carbon emissions impact the value of manufacturing companies that are listed on the Indonesia Stock Exchange (IDX), specifically during the years 2020 through 2024. This study uses a quantitative method with secondary data obtained from annual reports and sustainability reports. The sampling technique used is purposive sampling, resulting in 10 companies with a total of 50 observations, and hypothesis testing was performed using t-tests and F-tests as the basis for examining the partial and simultaneous effects of the variables. The partial results of the study show that IT Investment and Carbon Emission Disclosure have a negative and significant effect on Company Value. Meanwhile, simultaneous testing shows that IT Investment and Carbon Emission Disclosure have a significant effect on company value. The results of this study imply the importance of companies managing IT investment and emission disclosure strategically so that they are not considered a cost burden. Further research is recommended to add moderating or mediating variables to clarify the conditions that can strengthen firm value.

INTRODUCTION

Globalization is a process of economic, social, and political integration between countries characterized by increased trade, investment, capital flows, and the development of technology and information globally. Globalization drives changes in the economic structure and operational patterns of companies in the face of increasingly fierce market competition. However, globalization also poses various challenges, especially for developing countries, such as economic inequality, environmental pressure, and global economic uncertainty that affect the sustainability of company performance (Syamhari, 2023). In this context, companies must be capable of managing their strategic resources efficiently in order to stay competitive.

Indonesia is currently facing complex economic challenges, including inflation, social inequality, the impact of climate change, as well as geopolitical uncertainty and global commodity price fluctuations. On the other hand, technological advancements offer companies opportunities

to enhance efficiency, drive innovation, and boost performance by leveraging information technology (Harahap et al., 2025). However, in practice, increasing the use of information technology in Indonesia still faces various obstacles. A number of companies have made large-scale investments in technology, but the impact has not always been optimally reflected in company performance or market response. This condition shows that information technology investment does not only depend on the amount of funds, but also on the organization's readiness to manage it (Nugroho, 2026). Therefore, improving human resource competencies is an important factor in ensuring that technological developments can be utilized optimally (Anggionaldi et al., 2025).

Along with increased operational activities and technology use, companies also face greater pressure regarding environmental sustainability, particularly in carbon disclosure. Various reports indicate that there are still companies that have not fully met the standards for setting targets and disclosing carbon emissions transparently. This condition reflects that Carbon Emission Disclosure remains a strategic challenge for companies in maintaining sustainability and stakeholder trust (Darley, 2025).

Different ways that companies choose to invest in technology and manage their environmental impact will ultimately shape how investors behave in financial markets. The capital market is important for helping businesses get funding and investors make decisions, and the price of stocks is a major way to assess how well a company is doing and where it might be headed (Purboyo et al., 2020). Stock prices change a lot and are affected by how well a company is doing financially and how investors feel about the risks and future opportunities of the company (Tandelilin, 2021). Stock price fluctuations indicate the degree of risk that investors encounter, which means that detailed information is essential to help make informed investment choices (Artikanaya & Gayatri, 2020).

The increase in the number of investors participating in Indonesia's capital market in recent years indicates that a larger portion of the population is engaging in investment activities. This condition indicates that the capital market is expanding and investors are taking more time to thoroughly assess a company's performance and strategies before making investment decisions.

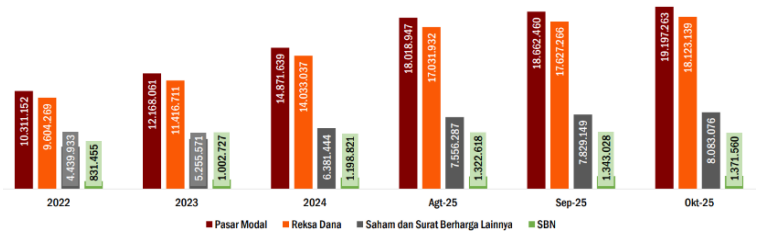

Figure 1

Increase in the Number of Investors in Indonesia

Source : (KSEI, 2025)

One of the industries that attracts significant attention from investors is manufacturing, due to its important role in contributing to the gross domestic product (GDP), creating employment opportunities, and supporting the nation's export activities (Lestari et al., 2023). Firm value is an important indicator that reflects the level of confidence investors have in a company's past performance and its prospects for the future, and growing firm value is a long-term goal for both the company and its shareholders (Risa & Hermanto, 2023).

However, the scenario in which the value of companies is declining continues to occur in Indonesia. At the end of 2023, the Composite Stock Price Index (IHSG) saw a decline of 0.43%, which was mainly due to investors deciding to take their profits (ANTARA News, 2023). In addition, during the year 2024, PT Semen Indonesia Tbk, which is a manufacturing company, saw a notable decrease in its stock price. The company's share price dropped by approximately 2.32% and has decreased by a total of 27.66% from the start of the year. This decrease was caused by poor financial results, shrinking activity in the local cement sector, and a lack of confidence in the industry's future outlook (Bisnis.com, 2024). In the same year, PT Unilever Indonesia Tbk experienced a decline in its financial performance, as indicated by the company's reduced net profit. The company's net profit decreased by 29.8% compared to the previous year, primarily due to lower net sales and smaller profit margins, as reported by (IDN Times, 2025). This condition shows that a company's value is largely influenced by how investors assess its performance and the approaches it takes to manage economic and environmental issues.

Similar research was previously conducted by (Pedersen et al., 2022) which looked into the effects of IT investments and skilled labor on firms' value added. The study shows that putting money into information technology helps increase the value of a company. A study conducted by (Silaban & Dewi, 2023) titled "The Effects of Green Innovation, Eco-Efficiency, Business Strategy, Technology Information Investment, and Profitability on Firm Value," examined how these factors affect the value of a company. The results of this study indicate that investments in information technology do not significantly affect the value of a company, even though the regression analysis reveals a negative coefficient. Research conducted by (Keristina et al., 2024) titled "The Influence of Corporate Social and Environmental Responsibility and Information Technology Investment on Firm Value with Company Innovation as a Moderating Variable in Mining Sector Companies Listed on the IDX in 2018-2022," found that investing in information technology does not have a significant effect on firm value.

Previous research conducted by (Sun et al., 2022), titled "Carbon Emission, Voluntary Carbon Disclosure and Firm Value," investigated how carbon emissions, voluntary carbon disclosure practices, and the value of firms are connected. The results of this study show that the

voluntary carbon disclosure variable has a positive and significant effect on the firm's value. A study conducted by (Askiah & Valdiansyah, 2025), titled "Carbon Emission Disclosure and Profitability on Firm Value," examined how a company's reporting of carbon emissions relates to its profitability and how these factors affect the company's overall value. The results of this study indicate that revealing carbon emissions has a significant adverse effect on a company's value. Research conducted by (Ramadhan et al., 2023), titled "Disclosure of Carbon Emissions, Covid-19, Green Innovations, Financial Performance, and Firm Value," reveals that carbon emission disclosure does not affect a company's value.

The different results from these studies indicate that there are variations in both the practical and theoretical views regarding how investing in information technology and disclosing carbon emissions can help increase the value of companies, particularly in the manufacturing industry in Indonesia. This research aims to explore the effect of investing in information technology and the reporting of carbon emissions on the value of manufacturing companies listed on the Indonesia Stock Exchange. The uniqueness of this study lies in its approach of analyzing both variables together by integrating aspects of technology and environmental sustainability into a single research framework, providing a more comprehensive empirical understanding within the context of the Indonesian capital market.

METHODS

This study uses a quantitative approach with an associative research design to investigate how IT investment and carbon emission disclosure affect the value of a company. The quantitative approach was chosen because it enables a clear and structured analysis of the connections between different factors through the use of numerical information. In this study, samples were selected using purposive sampling, a technique in which participants are chosen according to specific criteria that match the objectives of the research. The research examined all manufacturing companies that were publicly traded on the Indonesia Stock Exchange (IDX) during the period from 2020 to 2024. The samples were chosen based on manufacturing companies that were listed during the observation period, regularly published annual and sustainability reports, included details about their investments in information technology, and disclosed at least one type of carbon emissions during the research period.

Table 1

Sample Selection Scheme

No	Description	Number
1	Manufacturing companies listed on the Indonesia Stock Exchange (IDX) for period 2020-2024	472

2	Manufacturing companies that went public on the Indonesia Stock Exchange (IDX) for period 2020-2024	-160
3	Manufacturing companies that did not publish annual reports and sustainability reports consecutively from 2020 to 2024	-244
4	Manufacturing companies that did not disclose their IT investment for five consecytive years, as seen in their annual reports	-46
5	Manufacturing companies that have not disclosed their carbon emissions for five consecutive years, as seen in their annual reports and sustainability reports (minimum disclosure of one carbon emission item)	-12
	Total reseach sample	10
	Number of period	5
	Total company-year observations	50

Source: Data processed in 2025.

Variabel Independen

IT Investment

According to Widyaningtias (2014) in the study (Hartikayanti, 2024) states that information technology is an integrated tool that enables the processing and delivery of electronic data into valuable information for users. The utilization of information technology in organizations requires adequate resource and financial support to function optimally (Kertich et al., 2023). Information Technology Investment (IT Investment) is defined as the allocation of company funds to acquire, develop, and manage information technology, including hardware, software (Nurulia & Wijayana, 2025). IT investment is determined by applying the natural logarithm to the total amount of money spent on information technology. The following is the formula used to calculate IT investment as presented by (Alghorbany et al., 2022) :

Ln (IT Investment)

Carbon Emission Disclosure

Carbon emission disclosure involves companies reporting the total amount of carbon released into the environment as a result of their operations over a specific time period (Amira et al., 2024). Carbon emission disclosure is determined through content analysis based on the GRI 305 indicator, which is part of the GRI 300 series focused on environmental issues. Each item is evaluated using a binary scoring system, where a score of 1 means the information was disclosed and a score of 0 means it was not disclosed in the sustainability report. The formula for determining carbon emission disclosure, as outlined by (Muhammad & Aryani, 2021) is as follows:

$$CED = \frac{\text{Carbon Emission Disclosures}}{\text{Total Carbon Emission Disclosures}}$$

Variabel Dependen

Firm Value

Firm value shows how investors assess a company's effectiveness in managing its resources, and this is reflected in the stock price within the capital market, which demonstrates the level of confidence investors have in the company's historical performance and its potential for the future (Jayanti et al., 2024). Companies work to increase their worth over time, and how investors view these companies is shown through the changes in their stock prices on the exchange (Dewi & Ramadhan, 2024). This study uses Tobin's Q ratio to assess the value of a company, and the formula used is as follows:

$$Tobin's\ Q = \frac{\text{MVS + Total } Liabilities}{\text{Total } Asset}$$

MVS stands for the market value of all the shares that are currently held by the shareholders. MVS is part of the overall liabilities and is determined by dividing it by the total assets. If a company's Tobin's Q value is greater than one, it is viewed as overvalued, and if it is less than one, it is regarded as undervalued.

Framework and Hypothesis

This research framework was developed with reference to signaling theory, which is used as a conceptual basis for explaining the relationship between the information conveyed by companies and investors' perceived . In the context of this study, information on IT investment and carbon emission disclosure is viewed as indicators that reflect operational efficiency and corporate commitment to sustainability. This information serves as a foundation for investors to evaluate how well a company is performing and its future potential, which in turn influences the company's overall value.

Based on this foundation, the study organizes the relationship between variables within a research framework that outlines how IT investment and carbon emission disclosure affect the firm's value. This research framework forms the basis for developing an analysis model and defining research hypotheses, as shown in Figure 2 Research Model.

Based on the research framework that has been developed, the hypotheses in this study are formulated as follows:

H_1 : IT Investment has a positive and significant impact on Firm Value.

H_2: Carbon Emission Disclosure has a positive and significant impact on Firm Value.

H_3: IT Investment and Carbon Emission Disclosure have a simultaneous impact on Firm value.

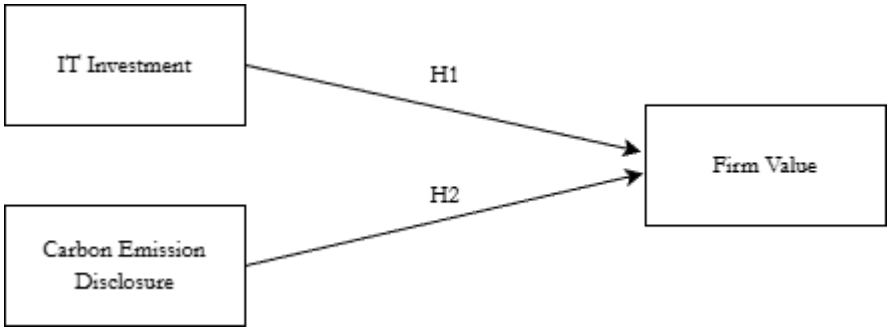

Figure 2

Research Model

The data utilized is secondary information gathered from annual reports, corporate sustainability reports, and other pertinent supporting documents. The analysis of data employed multiple linear regression to assess both the separate and combined effects of IT investment and carbon emission disclosure on the firm's value. Data analysis was carried out utilizing Microsoft Excel 2019 and IBM SPSS version 27. The analysis included the use of descriptive statistics, verification of classical assumptions, and execution of hypothesis tests to ensure the research findings are accurate and reliable.

RESULTS AND DISCUSSION

Research Results

At the start of the study, a sample of 50 observations was used. The findings from the normality test showed that some of the data points did not conform to a normal distribution and there were a few extreme values observed. Therefore, data that did not satisfy the normality assumption were excluded from the analysis to maintain the accuracy and reliability of the research findings. After finishing the data screening process, the number of observations that met the analysis criteria was reduced to 49. In addition, when the Cochrane-Orcutt method was used to address autocorrelation, the final analysis was conducted using 48 observations.

Descriptive Statistics

Descriptive statistics were employed to summarize the key features of the research data, covering the total number of observations, the lowest and highest values, the average value, and the measure of variability known as standard deviation for each variable in the study.

Table 2

Descriptive Statistics Test Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation

IT Investment	49	21,27	30,45	24,4504	2,49688
Carbon Emission Disclosure	49	0,06	0,39	0,2406	0,14032
Nilai Perusahaan	49	0,09	138,61	4,7508	19,73377
Valid N (listwise)	49				

Source: Data processed by SPSS (2026)

Based on the outcomes of the data processing, the study used 49 data points for its analysis. The IT Investment variable had a minimum value of 21.27, a maximum value of 30.45, an average value of 24.4504, and a standard deviation of 2.49688. This shows that the amount of money companies spend on information technology varies between different organizations, but generally stays within a reasonable range. The variable measuring carbon emissions disclosure has a minimum value of 0.06, a maximum value of 0.39, an average value of 0.2406, and a standard deviation of 0.14032. The results indicate that the companies included in the sample differ in the amount of information they share regarding their carbon emissions. Meanwhile, the firm value variable has a minimum value of 0.09 and a maximum of 138.61. The average value is 4.7508, and the standard deviation is 19.73377. The high standard deviation indicates that the values of the firms in the studied sample vary a lot.

Classical Assumption Test

1. Normality Test

The normality test was carried out to check if the residual data from the regression model follows a normal distribution.

Table 3

Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		49
Normal Parameters[a,b]	Mean	0,0000000
	Std. Deviation	0,86036236
Most Extreme Differences	Absolute	0,118
	Positive	0,101
	Negative	-0,118
Test Statistic		0,118
Asymp. Sig. (2-tailed)[c]		0,083

Monte Carlo Sig. (2-tailed)[d]	Sig.		0,087
	99% Confidence Interval	Lower Bound	0,080
		Upper Bound	0,094
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 926214481.			

Source: Data processed by SPSS (2026)

Based on the results of the One-Sample Kolmogorov-Smirnov test, an Asymp. Sig. (2-tailed) value of 0,083 was obtained. This value is higher than the significance level of 0.05, indicating that we can determine the residual data is normally distributed. Therefore, the regression model meets the assumption of normality.

2. Multicollinearity Test

The multicollinearity test is conducted to determine whether there is a significant relationship between the independent variables.

Table 4

Multicollinearity Test Results

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	IT Investment	0,855	1,169
	Carbon Emission Disclosure	0,855	1,169
a. Dependent Variable: Nilai Perusahaan			

Source: Data processed by SPSS (2026)

The test results show that the IT Investment and Carbon Emission Disclosure variables have tolerance values of 0.855 and variance inflation factor (VIF) values of 1.169, respectively. Tolerance values above 0.10 and VIF values under 10 indicate that there is no multicollinearity in the regression model.

3. Heteroscedasticity Test

The test for heteroscedasticity was conducted to determine whether there was a difference in the variability of residuals across the regression model.

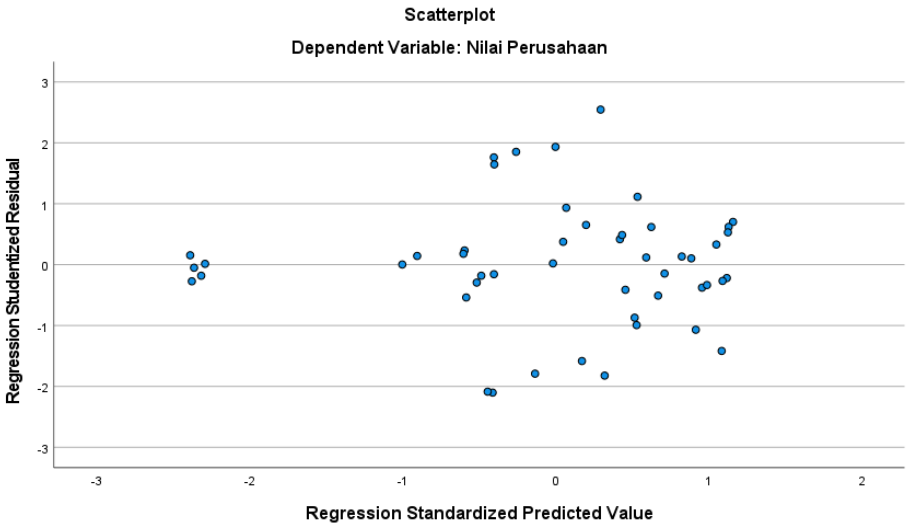

Figure 3

Heteroscedasticity Test Results

Source: Data processed by SPSS (2026)

From the scatterplot graph showing the test results, it is evident that the residual points are spread out in a random manner and do not form any specific pattern. Therefore, it can be concluded that the regression model does not have problems related to heteroscedasticity.

4. Autocorrelation Test

The autocorrelation test was performed to determine whether there is a connection between the error term in one time period and the error term in the immediately preceding period within the linear regression model.

Table 5

Autocorrelation Test Results

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,424[a]	0,180	0,144	0,8788669	0,579
a. Predictors: (Constant), Carbon Emission Disclosure, IT Investment					
b. Dependent Variable: Nilai Perusahaan					

Source: Data processed by SPSS (2026)

Based on the table provided, the results from the autocorrelation test show that the Durbin-Watson statistic is 0.579. This value is below the minimum threshold for the Durbin-Watson statistic, which is 1.628.Therefore, it can be stated that this study does not show any positive

autocorrelation in the decision that was rejected. Since there is no positive autocorrelation, the standard error and t-statistic values are not reliable, and therefore, corrective action is necessary. Autocorrelation was addressed in this study using the Cochrane-Orcutt method, as described below:

Table 6

Cochrane-Orcutt Autocorrelation Test Results

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,492[a]	0,242	0,208	0,55374	1,901
a. Predictors: (Constant), LAG_X2, LAG_X1					
b. Dependent Variable: LAG_Y					

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

According to the table given, after conducting the Cochrane-Orcutt test, the calculated Durbin-Watson statistic is 1.901. The obtained Durbin–Watson value is described as follows:

$$dU < DW < 4 - dU$$

$$1.628 < 1.901 < 4 - 1.628$$

$$1.628 < 1.901 < 2.372$$

Based on these calculations, it can be concluded that there is no evidence of positive or negative autocorrelation, since the decision to reject it was not supported. This suggests that the study is not influenced by autocorrelation.

Multiple Linear Regression Analysis

Table 7

Multiple Linear Regression Analysis Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0,720	0,270		2,663	0,011
	LAG_X1	-0,111	0,045	-0.333	-2,492	0,016
	LAG_X2	-1,360	0,625	-0,291	-2,177	0,035

a. Dependent Variable: LAG_Y

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

Based on the data presented in Table 7, the multiple linear regression equation can be written as follows:

$$Y = 0{,}720 - 0{,}111\ X1 - 1{,}360X2 + \varepsilon$$

The results from the multiple linear regression analysis show that IT investment has a negative regression coefficient of -0.111, implying that increased IT investment might be linked to a reduction in the firm's value. Carbon emission disclosure is linked to a regression coefficient of -1,360, indicating that increased transparency in carbon emissions may result in a lower valuation of the company.

Correlation Test

Correlation analysis is used to assess how strongly one set of variables (X) is related to another set of variables (Y). Correlation analysis helps to find out how different variables are related to each other, whether they are independent or dependent.

Table 8

Correlation Test Results

Correlations				
		LAG_X1	LAG_X2	LAG_Y
LAG_X1	Pearson Correlation	1	0,239	-0,403**
	Sig. (2-tailed)		0,101	0,005
	N	48	48	48
LAG_X2	Pearson Correlation	0,239	1	-0,371**
	Sig. (2-tailed)	0,101		0,009
	N	48	48	48
LAG_Y	Pearson Correlation	-0,403**	-0,371**	1
	Sig. (2-tailed)	0,005	0,009	
	N	48	48	48

Correlation is significant at the 0.01 level (2-tailed).

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

The results from the Pearson correlation analysis show that IT investment has a negative and statistically significant relationship with firm value, as indicated by a correlation coefficient of r = -0.403 and p = 0.005. In addition, the release of information about carbon emissions is linked to a negative and significant impact on the value of a company, with a correlation coefficient of r = -0.371 and p = 0.009. The findings indicate that throughout the observation period, a rise in IT spending combined with more transparent reporting of carbon emissions is frequently linked to a decrease in the company's value.

Determination Coefficient Test

Table 9

Coefficient of Determination Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,492	0,242	0,208	0,55374
a. Predictors: (Constant), LAG_X2, LAG_X1				
b. Dependent Variable: LAG_Y				

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

The results from the coefficient of determination test shown in Table 9 show an R Square value of 0.242. This suggests that 24.2% of the changes in firm value can be explained by the variables of IT investment and carbon emission disclosure, while the remaining 75.8% is attributed to other factors that were not included in the research model.

Hypothesis Testing

Partial Hypothesis Test (*t*-test)

Table 10

***t*-Test Results**

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.720	0.270		2.663	0.011
	LAG_X1	-.111	0.045	-.333	-2.492	0.016
	LAG_X2	-1.360	0.625	-.291	-2.177	0.035
a. Dependent Variable: LAG_Y						

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

The partial test results show that the significance level for IT investment and carbon emission disclosure is less than 0.05, which is the threshold used in this study. This indicates that these factors are significant in influencing the value of a company. In addition, the investments in IT and the disclosure of carbon emissions have negative t-values, specifically t = -2,492 and t = -2,177, respectively. It can therefore be concluded that investing in information technology and the disclosure of carbon emissions has a negative and significant effect on frm's value.

Simultaneous Hypothesis Test (*F* Test)

Table 11

***F*-Test Results**

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.408	2	2.204	7.187	0.002[b]
	Residual	13.798	45	0.307		
	Total	18.206	47			
a. Dependent Variable: LAG_Y						
b. Predictors: (Constant), LAG_X2, LAG_X1						

Source: Data processed by SPSS (2026)

Explanation:

LAG_X1 = IT Investment

LAG_X2 = Carbon Emission Disclosure

LAG_Y = Firm Value

The test results from the simultaneous analysis show an *F* value of 7,187 and a significance level of 0.002. The significance level is less than 0.05, which shows that both IT investment and carbon emission disclosure have a meaningful effect on the firm's value.

DISCUSSION

The Effect of IT Investment on Firm Value

The results of the hypothesis testing show that investing in information technology has a negative and significant impact on firm value, indicating that higher investments in information technology do not always lead to a positive reaction from the market. This finding reflects a divergence between the expected long-term benefits of information technology investment and investors' short-term perceptions. Although information technology investment is often associated with improved operational efficiency and competitive advantage, the realization of these benefits requires substantial time and costs. As a result, investors may perceive information technology investment as an increase in initial costs that could suppress short-term financial performance, thereby negatively affecting firm value.

The findings of this study do not fully agree with earlier research that suggested information technology investment does not significantly impact firm value. However, the study by (Silaban & Dewi, 2023) indicates a negative regression coefficient, and the study by (Keristina et al., 2024) also reports a negative relationship, although this finding is not statistically significant. These findings suggest that investments in information technology have not delivered noticeable benefits because their economic advantages have not been fully achieved and are not yet visible in the company's overall performance.

The Effect of Carbon Emission Disclosure on Firm Value

The findings show that carbon emissions disclosure has a negative and significant impact on firm value, implying that greater transparency in carbon emissions is linked to lower market values. Empirically, this finding indicates that investors have not yet fully recognized carbon emission disclosure as a positive sign for a company's future performance. Instead, they tend to view it as a signal of higher environmental risks and possible extra costs that could negatively affect the company's financial results.

These results agree with the study by (Askiah & Valdiansyah, 2025) which found that carbon emissions disclosure has a negative effect on firm value. However, these findings contradict the study (Sun et al., 2022), which claimed that disclosing carbon emissions positively impacts a company's value. The variation in research findings could result from differences in market

features, the time frames studied, and the extent to which investors are aware of and react to environmental concerns. From the perspective of signaling theory, disclosing carbon emissions is seen as an indication of possible risks and future costs, which can lead to a decrease in firm value.

The Effect of IT Investment and Carbon Emission Disclosure on Firm Value

Based on the test results conducted at the same time, both IT investment and carbon emission disclosure have a significant effect on the firm value. Therefore, the idea that investing in information technology and disclosing carbon emissions significantly impacts a company's value is supported. These findings suggest that investors do not evaluate technology investment policies and carbon emission disclosures as separate issues, but instead consider them together as part of a broader strategic insight when judging a company's future potential and overall quality. From the viewpoint of signaling theory, the information that companies release, such as investments in information technology or disclosures about non-financial aspects, helps to lessen the gap in knowledge between company management and investors, and it also affects how the market evaluates the value of the firm.

CONCLUSION

This study explores the effect of investing in information technology and the disclosure of carbon emissions on the value of manufacturing firms that are listed on the Indonesia Stock Exchange, focusing on the period from 2020 to 2024. The results show that, to a certain degree, putting money into information technology and sharing carbon emissions data can have a harmful and important effect on firm value. These results show that the capital market generally sees technology investment and carbon emission disclosure as factors that raise costs and risks in the short term, meaning investors have not yet fully recognized them as positive signs.

At the same time, it was found that investments in IT and the disclosure of carbon emissions significantly impact a company's value, showing that investors consider both financial and non-financial information together when assessing a company's future potential. This research makes a practical contribution by expanding the existing body of knowledge regarding how investments in technology and disclosures on sustainability affect the value of companies within the Indonesian stock market.

This study has some limitations, including a relatively small sample size and the fact that the independent variables considered are still limited to IT investment and carbon emission disclosure. Therefore, the results of this study need to be examined thoughtfully. Future studies are anticipated to include additional factors like profitability, company size, corporate governance, or innovation as either moderating or mediating variables. Additionally, the research is expected to extend the time frame and cover more sectors.

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